



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,501	10/31/2003	Heon Lee	200209239-1	9608

22879 7590 05/23/2006

HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

DINH, SON T

ART UNIT PAPER NUMBER

2824

DATE MAILED: 05/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/698,501

Applicant(s)

LEE ET AL.

Examiner

Son T. Dinh

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 April-2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 12-20 is/are pending in the application.
- 4a) Of the above claim(s) 18 and 20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16 is/are allowed.
- 6) ☒ Claim(s) 1-3, 12, 17 and 19 is/are rejected.
- 7) ☒ Claim(s) 4-10 and 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/6/04</u> . | 6) <input checked="" type="checkbox"/> Other: <u>East search history</u> .              |

### **DETAILED ACTION**

The Election filed on 4/24/06 has been entered.

Claims 1-10, 12-20 are pending in the application.

Claims 18 and 20 are withdrawn from consideration in view of the election.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 12, 17 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Nickel et al (U.S. Patent 6,603,678).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

For the purpose of this rejection, a resistor would be considered as a spacer (as defined by the applicant in the specification). To be more specific, any spacer that

causes electro-resistive heating (or a thermally insulating material) would be considered as a resistor. Therefore, layer 24 (figure 1 of Nickel et al) that is an electrically insulating, thermally conductive material would be considered as a resistor.

Regarding claim 1, Nickel et al disclose a MRAM comprising an array of magnetic memory cells (112, figure 3), a grid of bit and word lines (116 and 118, figure 3), a plurality of corresponding resistors (24, figure 1; also see the explanation above) each placed in series with the magnetic cell (12, 14 and 16 formed a cell and layer 24 is connected in series with this cell, see figure 1). It is noted that layer 24 is a thermally conductive material, then it would perform the function of causing heating of the magnetic memory cells.

Regarding claim 2, the resistor 24 (or layer) inherently performs the function of reducing heat-sinking of the selected magnetic memory cells.

Regarding claim 3, since layer 24 is a thermally conductive material, it would perform the function of causing electro resistive heating of the selected magnetic memory cells.

Regarding claim 12, the layer 24 clearly connected a line with a respective one of the magnetic memory cell (see figure 1) and having a connection face (the lower a face of 24) that uses a thermally insulating material.

Regarding claim 17, the applicant is referred to the rejection applied to claim 1 for the reasons of this rejection. Further, the layer 24 inherently increase the thermally resistance for heat generated by the memory cell because it is a thermally conductive material.

Regarding claim 18, the heat generated by layer 24 would surely ease cell state switching of memory cells.

### ***Allowable Subject Matter***

Claim 16 is allowed.

Claims 4-10, 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fail to teach or suggest a spacer that has a connection face that has a perimeter portion that is electrically conductive and a core portion that is thermally insulating (claims 4, 8, 12); a perimeter conductive portion that is created an isotropic etch process that removes electrically conductive material from a core portion of the space (claim 6); the corresponding resistors are formed as areas of reduced cross section of the lines in the grid (claim 13); a spacer having a connection face that has a recess which is filled with an electrically insulating material (claim 16).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-Kim et al disclose a memory device having an insulating layer.

-Perner et al disclose a magnetic memory device having a resistor.

Art Unit: 2824

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Son T. Dinh whose telephone number is 571-272-1868. The examiner can normally be reached on Monday to Friday 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on 571-272-1869. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S. Dinh  
May 20, 2006



Son T. Dinh  
Primary Examiner